

I claim:

1. An optical storage medium, comprising:  
a first layer having a pattern of features in at least one major surface; and  
a first semi-reflective coating adjacent the first layer, the first semi-reflective coating including a first metal alloy, said first metal alloy includes silver and cadmium, and wherein the relationship between the amounts of silver and cadmium is defined by  $Ag_xCd_c$  where  $0.85 < x < 0.9999$  and  $0.0001 < c < 0.15$ .

2. The medium of claim 1, and wherein  $0.001 < c < 0.10$ .

3. The medium of claim 1 wherein said first coating directly contacts said first metal alloy.

4. The medium of claim 1, further including:  
a second layer having a pattern of features in at least one major surface; and  
a second coating adjacent the second layer.

5. The medium of claim 1 further including:  
a second layer said second layer including a dielectric material;

a third layer having a pattern of features in at least one major surface, said third layer including an optically re-recordable material; and

a fourth layer said fourth layer including a dielectric material.

6. The medium of claim 5 wherein the optically re-recordable material is a phase-changeable material.

7. The medium of claim 6 wherein the optically re-recordable material further comprises a phase changeable material selected from the group consisting of Ge-Sb-Te, Ag-In-Sb-Te, Cr-Ge-Sb-Te, As-Te-Ge, Te-Ge-Sn, Te-Ge-Sn-O, Te-Se, Sn-Te-Se, Te-Ge-Sn-Au, Ge-Sb-Te, Sb-Te-Se, In-Se-Tl, In-Sb, In-Sb-Se, In-Se-Tl-Co, and Si-Te-Sn.

8. The medium of claim 5 wherein the optically re-recordable material is a magneto-optic material.

9. The medium of claim 8 wherein the optically re-recordable material further comprises a magneto-optic material selected from the group consisting of Tb-Fe-Co and Gd-Tb-Fe.

10. The medium of claim 1, wherein cadmium is present in the first metal alloy from about 0.01 a/o percent to about 20.0 a/o percent of the amount of silver present.

11. The medium of claim 1, wherein the first metal alloy includes lithium present from about 0.01 a/o percent to about 10.0 a/o percent of the amount of silver present.

12. The medium of claim 1, wherein the first metal alloy includes manganese present from about 0.01 a/o percent to about 7.5 a/o percent of the amount of silver present.

13. The medium of claim 1, wherein the first metal alloy includes a metal selected from the group consisting of gold, rhodium, copper, ruthenium, osmium, iridium, platinum and palladium and mixtures thereof, and wherein the metal is present from about 0.01 a/o percent to about 5.0 a/o percent of the amount of silver present.

14. The medium of claim 1, and wherein the first metal alloy includes a metal selected from the group consisting of titanium, nickel, indium, germanium, tin, antimony, gallium, silicon, boron, zirconium, molybdenum and mixtures thereof, and wherein the metal is present from about 0.01 a/o percent to about 5.0 a/o percent of the amount of silver present.

15. An optical storage medium, comprising:  
a first layer having a pattern of features in at least one major surface; and  
a first semi-reflective coating adjacent the first layer, the first semi-reflective coating including a first metal alloy, said first metal alloy including silver and lithium, and wherein the relationship between the amounts of silver and lithium is defined by  $Ag_xLi_I$  where  $0.85 < x < 0.9999$  and  $0.0001 < I < 0.15$ .

16. The medium of claim 15, and wherein  $0.001 < I < 0.10$ .

17. The medium of claim 15, wherein said first coating directly contacts said first metal alloy.

18. The medium of claim 15, further including:  
a second layer having a pattern of features in at least one major surface; and  
a second coating adjacent the second layer.

19. The medium of claim 15, further including:  
a second layer, said second layer including a dielectric material;

a third layer having a pattern of features in at least one major surface, said third layer including an optically re-recordable material; and  
a fourth layer, said fourth layer including a dielectric material.

20. The medium of claim 19, wherein the optically recordable material is a phase-changeable material.

21. The medium of claim 20, wherein the optically recordable material further comprises a phase changeable material selected from the group consisting of Ge-Sb-Te, Ag-In-Sb-Te, Cr-Ge-Sb-Te, As-Te-Ge, Te-Ge-Sn, Te-Ge-Sn-O, Te-Se, Sn-Te-Se, Te-Ge-Sn-Au, Ge-Sb-Te, Sb-Te-Se, In-Se-Tl, In-Sb, In-Sb-Se, In-Se-Tl-Co, and Si-Te-Sn.

22. The medium of claim 15, wherein the optically re-recordable material is a magneto-optic material.

23. The medium of claim 22, wherein the optically re-recordable material further comprises a magneto-optic material selected from the group consisting of Tb-Fe-Co and Gd-Tb-Fe.

24. The medium of claim 15, wherein the first metal alloy includes cadmium present from about 0.01 a/o percent to about 20.0 a/o percent of the amount of silver present.

25. The medium of claim 15, wherein lithium is present the first metal alloy from about 0.01 a/o percent to about 10.0 a/o percent of the amount of silver present.

26. The medium of claim 15, wherein the first metal alloy includes manganese present from about 0.01 a/o percent to about 7.5 a/o percent of the amount of silver present.

27. The medium of claim 15, wherein the first metal alloy includes a metal selected from the group consisting of gold, rhodium, copper, ruthenium, osmium, iridium, platinum and palladium and mixtures thereof, and wherein the metal is present from about 0.01 a/o percent to about 5.0 a/o percent of the amount of silver present.

28. The medium of claim 15, and wherein the first metal alloy includes a metal selected from the group consisting of titanium, nickel, indium, chromium, germanium, tin, antimony, gallium, silicon, boron, zirconium, molybdenum and mixtures thereof, and wherein the metal is

present from about 0.01 a/o percent to about 5.0 a/o percent of the amount of silver present.

29. An optical storage medium, comprising:  
a first layer having a pattern of features in at least one major surface; and  
a first semi-reflective coating adjacent the first layer, the first semi-reflective coating including a first metal alloy, said first metal alloy including silver and nickel; and wherein the relationship between the amounts of silver and nickel is defined by  $Ag_xNi_n$  where  $0.90 < x < 0.9999$  and  $0.0001 < n < 0.10$ .

30. The medium of claim 29, and wherein  $0.001 < n < 0.05$ .

31. The medium of claim 29 wherein said first coating directly contacts said first metal alloy.

32. The medium of claim 29, further including:  
a second layer having a pattern of features in at least one major surface; and  
a second coating adjacent the second layer.

33. The medium of claim 29, further including:

a second layer, said second layer including a dielectric material;

a third layer having a pattern of features in at least one major surface, said third layer including an optically re-recordable material; and

a fourth layer, said fourth layer including a dielectric material.

34. The medium of claim 33, wherein the optically re-recordable material is a phase-changeable material.

35. The medium of claim 34, wherein the optically re-recordable material further comprises a phase changeable material selected from the group consisting of Ge-Sb-Te, Ag-In-Sb-Te, Cr-Ge-Sb-Te, As-Te-Ge, Te-Ge-Sn, Te-Ge-Sn-O, Te-Se, Sn-Te-Se, Te-Ge-Sn-Au, Ge-Sb-Te, Sb-Te-Se, In-Se-Tl, In-Sb, In-Sb-Se, In-Se-Tl-Co, and Si-Te-Sn.

36. The medium of claim 33, wherein the optically re-recordable material is a magneto-optic material.

37. The medium of claim 36, wherein the optically re-recordable material further comprises a magneto-optic material selected from the group consisting of Tb-Fe-Co and Gd-Tb-Fe.



38. The medium of claim 29, wherein the first metal alloy includes cadmium present from about 0.01 a/o percent to about 20.0 a/o percent of the amount of silver present.

39. The medium of claim 29, wherein the first metal alloy includes lithium present from about 0.01 a/o percent to about 10.0 a/o percent of the amount of silver present.

40. The medium of claim 29, wherein the first metal alloy includes manganese present from about 0.01 a/o percent to about 7.5 a/o percent of the amount of silver present.

41. The medium of claim 29, wherein the first metal alloy includes a metal selected from the group consisting of gold, rhodium, copper, ruthenium, osmium, iridium, platinum and palladium and mixtures thereof, and wherein the metal is present from about 0.01 a/o percent to about 5.0 a/o percent of the amount of silver present.

42. The medium of claim 29, and wherein the first metal alloy includes a metal selected from the group consisting of titanium, indium, chromium, germanium, tin, antimony, gallium, silicon, boron, zirconium, molybdenum and mixtures thereof, and wherein the metal is present from

about 0.01 a/o percent to about 5.0 a/o percent of the amount of silver present.

43. An optical storage medium, comprising:  
a first layer having a pattern of features in at least one major surface; and  
a first semi-reflective coating adjacent the first layer, the first semi-reflective coating including a first metal alloy, said first metal alloy includes silver and manganese, and wherein the relationship between the amounts of silver and manganese is defined by  $Ag_xMn$  where  $0.90 < x < 0.9999$  and  $0.0001 < m < 0.10$ .

44. The medium of claim 43, and wherein  $0.001 < m < 0.05$ .

45. The medium of claim 43, wherein said first coating directly contacts said first metal alloy.

46. The medium of claim 43, further including:  
a second layer having a pattern of features in at least one major surface; and  
a second coating adjacent the second layer.

47. The medium of claim 43, further including:  
a second layer, said second layer including a dielectric

material;  
a third layer having a pattern of features in at least one major surface, said third layer including an optically re-recordable material; and  
a fourth layer, said fourth layer including a dielectric material.

48. The medium of claim 47, wherein the optically re-recordable material is a phase-changeable material.

49. The medium of claim 48, wherein the optically re-recordable material further comprises a phase changeable material selected from the group consisting of Ge-Sb-Te, Ag-In-Sb-Te, Cr-Ge-Sb-Te, As-Te-Ge, Te-Ge-Sn, Te-Ge-Sn-O, Te-Se, Sn-Te-Se, Te-Ge-Sn-Au, Ge-Sb-Te, Sb-Te-Se, In-Se-Tl, In-Sb, In-Sb-Se, In-Se-Tl-Co, and Si-Te-Sn.

50. The medium of claim 47, wherein the optically re-recordable material is a magneto-optic material.

51. The medium of claim 50, wherein the optically re-recordable material further comprises a magneto-optic material selected from the group consisting of Tb-Fe-Co and Gd-Tb-Fe.

52. The medium of claim 43, wherein the first metal alloy includes cadmium present from about 0.01 a/o percent to about 20.0 a/o percent of the amount of silver present.

53. The medium of claim 43, wherein the first metal alloy includes lithium present from about 0.01 a/o percent to about 10.0 a/o percent of the amount of silver present.

54. The medium of claim 43, wherein manganese is present in the first metal alloy from about 0.01 a/o percent to about 7.5 a/o percent of the amount of silver present.

55. The medium of claim 43, wherein the first metal alloy includes a metal selected from the group consisting of gold, rhodium, copper, ruthenium, osmium, iridium, platinum and palladium and mixtures thereof, and wherein the metal is present from about 0.01 a/o percent to about 5.0 a/o percent of the amount of silver present.

56. The medium of claim 43, and wherein the first metal alloy includes a metal selected from the group consisting of titanium, nickel, indium, chromium, germanium, tin, antimony, gallium, silicon, boron, zirconium, molybdenum and mixtures thereof, and wherein the metal is

present from about 0.01 a/o percent to about 5.0 a/o percent of the amount of silver present.

57. An optical storage medium, comprising:  
a first layer having a pattern of features in at least one major surface; and  
a first semi-reflective coating adjacent the first layer, the first semi-reflective coating including a first metal alloy, said first metal alloy including silver and titanium, and wherein the relationship between the amounts of silver and titanium is defined by  $Ag_xTi_t$  where  $0.90 < x < 0.9999$  and  $0.0001 < t < 0.10$ .

58. The medium of claim 57, and wherein  $0.001 < t < 0.10$ .

59. The medium of claim 57, wherein said first coating directly contacts said first metal alloy.

60. The medium of claim 57, further including:  
a second layer having a pattern of features in at least one major surface; and  
a second coating adjacent the second layer.

61. The medium of claim 57, further including:

a second layer, said second layer including a dielectric material;

a third layer having a pattern of features in at least one major surface, said third layer including an optically re-recordable material; and

a fourth layer, said fourth layer including a dielectric material.

62. The medium of claim 61, wherein the optically re-recordable material is a phase-changeable material.

63. The medium of claim 62, wherein the optically re-recordable material further comprises a phase changeable material selected from the group consisting of Ge-Sb-Te, Ag-In-Sb-Te, Cr-Ge-Sb-Te, As-Te-Ge, Te-Ge-Sn, Te-Ge-Sn-O, Te-Se, Sn-Te-Se, Te-Ge-Sn-Au, Ge-Sb-Te, Sb-Te-Se, In-Se-Tl, In-Sb, In-Sb-Se, In-Se-Tl-Co, and Si-Te-Sn.

64. The medium of claim 61, wherein the optically re-recordable material is a magneto-optic material.

65. The medium of claim 64, wherein the optically re-recordable material further comprises a magneto-optic material selected from the group consisting of Tb-Fe-Co and Gd-Tb-Fe.

66. The medium of claim 57, wherein the first metal alloy includes cadmium present from about 0.01 a/o percent to about 20.0 a/o percent of the amount of silver present.

67. The medium of claim 57, wherein the first metal alloy includes lithium present from about 0.01 a/o percent to about 10.0 a/o percent of the amount of silver present.

68. The medium of claim 57, wherein the first metal alloy includes manganese present from about 0.01 a/o percent to about 7.5 a/o percent of the amount of silver present.

69. The medium of claim 57, wherein the first metal alloy includes a metal selected from the group consisting of gold, rhodium, copper, ruthenium, osmium, iridium, platinum and palladium and mixtures thereof, and wherein the metal is present from about 0.01 a/o percent to about 5.0 a/o percent of the amount of silver present.

70. The medium of claim 57, and wherein the first metal alloy includes a metal selected from the group consisting of nickel, indium, chromium, germanium, tin, antimony, gallium, silicon, boron, zirconium, molybdenum and mixtures thereof, and wherein the metal is present from

about 0.01 a/o percent to about 5.0 a/o percent of the amount of silver present.

71. An optical storage medium, comprising:  
a first layer having a pattern of features in at least one major surface; and  
a first semi-reflective coating adjacent the first layer, the first semi-reflective coating including a first metal alloy, said first metal alloy including silver and zirconium, and wherein the relationship between the amounts of silver and zirconium is defined by  $Ag_xZr_z$  where  $0.90 < x < 0.9999$  and  $0.0001 < z < 0.10$ .

72. The medium of claim 71, and wherein  $0.001 < z < 0.10$ .

73. The medium of claim 71 wherein said first coating directly contacts said first metal alloy.

74. The medium of claim 71, further including:  
a second layer having a pattern of features in at least one major surface; and  
a second coating adjacent the second layer.

75. The medium of claim 71, further including:



a second layer, said second layer including a dielectric material;

a third layer having a pattern of features in at least one major surface, said third layer including an optically re-recordable material; and

a fourth layer, said fourth layer including a dielectric material.

76. The medium of claim 75, wherein the optically re-recordable material is a phase-changeable material.

77. The medium of claim 76, wherein the optically re-recordable material further comprises a phase changeable material selected from the group consisting of Ge-Sb-Te, Ag-In-Sb-Te, Cr-Ge-Sb-Te, As-Te-Ge, Te-Ge-Sn, Te-Ge-Sn-O, Te-Se, Sn-Te-Se, Te-Ge-Sn-Au, Ge-Sb-Te, Sb-Te-Se, In-Se-Tl, In-Sb, In-Sb-Se, In-Se-Tl-Co, and Si-Te-Sn.

78. The medium of claim 75, wherein the optically re-recordable material is a magneto-optic material.

79. The medium of claim 78, wherein the optically re-recordable material further comprises a magneto-optic material selected from the group consisting of Tb-Fe-Co and Gd-Tb-Fe.

80. The medium of claim 71, wherein the first metal alloy includes cadmium present from about 0.01 a/o percent to about 20.0 a/o percent of the amount of silver present.

81. The medium of claim 71, wherein the first metal alloy includes lithium present from about 0.01 a/o percent to about 10.0 a/o percent of the amount of silver present.

82. The medium of claim 71, wherein the first metal alloy includes manganese present from about 0.01 a/o percent to about 7.5 a/o percent of the amount of silver present.

83. The medium of claim 71, wherein the first metal alloy includes a metal selected from the group consisting of gold, rhodium, copper, ruthenium, osmium, iridium, platinum and palladium and mixtures thereof, and wherein the metal is present from about 0.01 a/o percent to about 5.0 a/o percent of the amount of silver present.

84. The medium of claim 71, and wherein the first metal alloy includes a metal selected from the group consisting of titanium, nickel, indium, chromium, germanium, tin, antimony, gallium, silicon, boron, molybdenum and mixtures thereof, and wherein the metal is present from

about 0.01 a/o percent to about 5.0 a/o percent of the amount of silver present.